

PATENT COOPERATION TREATY

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From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

10 DEC 2004

To:

Leandro, Arechederra
EXXONMOBIL CHEMICAL COMPANY
P.O. Box 2149
Baytown, TX 77522-2149
ETATS-UNIS D'AMERIQUE

SEP 29 2004
NOTIFICATION OF TRANSMITTAL OF
INTERNATIONAL PRELIMINARY
EXAMINATION REPORT
(PCT Rule 71.1)

Date of mailing
(day/month/year) 23.09.2004

Applicant's or agent's file reference
2002B093

IMPORTANT NOTIFICATION

International application No. PCT/US 03/17204	International filing date (day/month/year) 30.05.2003	Priority date (day/month/year) 05.07.2002
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Applicant
EXXONMOBIL CHEMICAL PATENTS INC. et al

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.
4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed inventions is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

ACKNOWLEDGED
PATENT LEGAL ASSISTANT GROUP
G. M. CARROLL

Authorized Officer

Borinski, W SEP 29 2004

Tel: +49 89 2399-8237

☐ Reminder
☐ File

EMCLT
BAYTOWN



Name and mailing address of the international
preliminary examining authority:



European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0 Tx: 523656 epmu d
Fax: +49 89 2399 - 4465

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT Article 36 and Rule 70)

Applicant's or agent's file reference 2002B093	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/US 03/17204	International filing date (day/month/year) 30.05.2003	Priority date (day/month/year) 05.07.2002
International Patent Classification (IPC) or both national classification and IPC C08K3/34		
Applicant EXXONMOBIL CHEMICAL PATENTS INC. et al		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.


2. This REPORT consists of a total of 6 sheets, including this cover sheet.


☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 24.12.2003	Date of completion of this report 23.09.2004
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Meier, S Telephone No. +49 89 2399-8312



**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/US 03/17204

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*):

Description, Pages

1-37 as originally filed

Claims, Numbers

1-71 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/US 03/17204**

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes: Claims	20, 21, 46, 47, 70, 71
	No: Claims	1-19, 22-45, 48-69
Inventive step (IS)	Yes: Claims	-
	No: Claims	1-71
Industrial applicability (IA)	Yes: Claims	1-71
	No: Claims	-

2. Citations and explanations

see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/US 03/17204

Concerning Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

- D1:** WO 02 24759 A (ROHM AND HAAS COMPANY)
- D2:** WO 01 96467 A (BASELL TECHNOLOGY COMPANY B.V.)
- D3:** US-A-5 665 183 (E. N. KRESGE)
- D4:** EP-A-0 472 344 (UBE INDUSTRIES, LTD.)

1. Clarity - Art. 6 PCT

- 1.1** Claims 11, 37 and 61 of the present application do not meet the requirements of Art. 6 PCT in that the matter for which protection is sought is not clearly defined. The claims attempt to define the subject-matter in terms of the "*result to be achieved*", which merely amounts to a statement of the underlying problem, without providing the technical features necessary for achieving this result (cf. also PCT-Guidelines III-4.7).
- 1.2** Although claims 48-71 of the present application have been drafted as separate independent claims, they appear to relate effectively to the same subject-matter and to differ from each other only with regard to the definition of the subject-matter for which protection is sought and/or in respect of the terminology used for the features of that subject-matter. The aforementioned claims therefore lack conciseness and as such do not meet the requirements of Art. 6 PCT.
- 1.3** Claims 1-10, 13-36, 39-60 and 63-71 are not supported by the description as required by Art. 6 PCT, as their scope is broader than justified by the description. The reasons therefor are the following: page 1, lines 1-2 of the present description states that "*Nanocomposites are polymer systems containing inorganic particles with at least one dimension in the nanometre range.*" However, the applicant has not shown in the present application that also non-exfoliated clay material does fulfill these requirements. Therefore, it is questionable that blends comprising elastomer, clay, etc. would fulfill the requirements of a nanocomposite as outlined above.

2. Novelty

- 2.1** The independent claim 1 of the present application claims:
 - a)** A nanocomposite comprising
 - b)** clay and

- c) an elastomer comprising C₂ to C₁₀ olefin derived units;
 - d) wherein the elastomer also comprises functionalised monomer units having functional groups pendant to the elastomer selected from ...
- 2.2 Document **D1** discloses a) A nanocomposite composition comprising b) a clay material c) and an ethylenically unsaturated monomer comprising e.g. styrene, methyl-styrene, butadiene, isoprene, ethylene etc. d) wherein the elastomer also comprises functional monomers like maleic and itaconic acid which are incorporated and not attached to the polymer backbone e) The components are provided as different monomer emulsions and are contacted in the presence of an initiator system like persulfate salt. f) The compositions are not processed by melt blending g) The compositions show enhanced barrier properties ([0025]-[0029]; [0038]-[0043], [0055]-[0064]; [0082]-[0084]; claims).
- 2.3 Therefore, the present application does meet the criteria of Art. 33(1) PCT, because the subject-matter of claims 1-71 is novel in the sense of Article 33(2) PCT with respect to **D1**.
- 2.4 Document **D2** discloses a) Composite materials comprising b) a clay material which can also be a clay treated with quaternary ammonium ions c) 2-45 wt% of one or more rubber components like Kraton® FG1901X a styrene/ethene-butene-1/styrene triblockcopolymer rubber d) modified with maleic anhydride - which is indeed the same composition as claimed by the present application. e) The components are melt blended using an extruder (page 7, line 1-page 10, line 2; page 11, line 16-page 12, line 23).
- 2.5 Therefore, the present application does not meet the criteria of Art. 33(1) PCT, because the subject-matter of claims 1-19, 22-45 and 48-69 is not new in the sense of Article 33(2) PCT with respect to document **D2**.
- 2.6 Document **D4** discloses a) A composition comprising 60-5 wt% of a clay-polyamide composite, b) an elastomer based on ethylene- α -olefin copolymer rubber and/or hydrogenated block copolymer of a monovinyl aromatic compound, e.g. styrene d) wherein the elastomer has been modified by the treatment with unsaturated carboxylic acids or their derivatives like maleic and fumaric acid/anhydride. e) A radical-generating compound such as an organic peroxide can be used as the initiator for the graft-modifying reaction. The compositions obtained are the same as claimed by the present application. f) The process can be carried out e.g. in an extruder by melt blending. g) The use of exfoliated clays has not been disclosed (abstract; page 4, line 36-page 5, line 26; page 6, line 1-page 7, line 24; claims).
- 2.7 Therefore, the present application does not meet the criteria of Art. 33(1) PCT, because the subject-matter of claims 1-10, 13-19, 22-36, 39-45, 48-60 and 63-69 is not new in the sense of Art. 33(2) PCT.

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/US 03/17204

- 2.8** Although the composition has been defined using a "*product by process*" formulation, the subject matter of claims 48-69 is the product *per se*, namely the "*nanocomposite*". The *by-process* element of this claim is given no patentable weight unless and until it is demonstrated/made plausible that the product of the present claims differs from those of **D2** and **D4**.

3. Inventive Step

- 3.1** Document **D3** discloses **a)** A tire inner-liner and inner-tube comprising **b)** a layered silicate clay **c)** a rubber component like polyisobutylene, polybutadiene, propylene, ethylene, etc. **d)** Part of the rubber has been modified by attaching an onium salt. **e)** The composition shows a low air permeability (abstract; column 1, line 9-column 2, line 7; column 2, line 43-column 4, line 17; claims).
- 3.2** **D3** is considered to represent the closest prior art document.
- 3.3** The difference between **D3** and the present application is the use of elastomers which have been modified by different functional groups based on unsaturated dicarboxylic acids and their derivatives.
- 3.4** In the absence of any technical effect, which is due to the distinguishing feature, the objective technical problem to be solved was to provide an alternative.
- 3.5** However, the use of these modified polymers in compositions has already been known from the technical teaching of documents **D2** and **D4**.
- 3.6** It would have been obvious for the person skilled in the art to combine the teaching of **D3** on compositions for tire inner-liner and inner-tubes with the teaching of documents **D2** and **D4** on other modified elastomers which are suitable for clay containing compositions. Especially **D2** discloses the treatment of the clay with quaternary ammonium compounds.
- 3.7** Therefore, the present application does not meet the criteria of Art. 33(1) PCT, because the subject-matter of claims 20-21, 37,38, 46-47 and 70-71 does not involve an inventive step in the sense of Art. 33(3) PCT.

4. Industrial Applicability

- 4.1** The subject matter of claims 1-71 is industrial applicable.